ITBMS 2016
27 - 30 June 2016 - Carcassonne, France

itbms.onera.fr
The 11th International IR Target and Background Modeling & Simulation Workshop is open to people from the defense research and development community active in the field of optical signature simulation technologies, to military users and to industry representatives.

**General Workshop Objectives**
Provide a European scientific forum for the IR modeling and simulation community to discuss current developments in their field of expertise
Foster an intensive exchange of ideas and results in IR modeling and simulation and help building up and maintain the information network in the community
Encourage cooperation between groups actively engaged in this field

**Topical Session Objectives**
Provide an opportunity for the software end-users to learn about the latest developments.
Offer the opportunity to demonstrate and discuss the latest features in software products

**TOPICS**
All sessions of the workshop will be unclassified. Contributions are solicited in subjects ranging from basic signature research to applications in system design, optimization and evaluation

- Data, techniques, models, and validation of IR signatures of land, sea and air targets and backgrounds, and of targets in backgrounds
- Extension to infrared polarization hyperspectral and active signatures
- Optical properties of complex surfaces
- Models validation and metrics
- IR signature management models
- Modeling and simulation of IR clutter (soil, maritime, atmospheric)
- Radiative transfer, propagation models and optical data sets
- Impact of climatic conditions on signatures
- Active / Laser imaging systems

**SPONSORS**
**INTERNATIONAL PROGRAM COMMITTEE**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Curran</td>
<td>ThermoAnalytics Inc.</td>
<td>USA</td>
</tr>
<tr>
<td>Latger Jean</td>
<td>OKTAL-SE</td>
<td>France</td>
</tr>
<tr>
<td>Repasi Endre</td>
<td>Fraunhofer-IOSB</td>
<td>Germany</td>
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<tr>
<td>Riviere Nicolas</td>
<td>ONERA</td>
<td>France</td>
</tr>
<tr>
<td>Rosier Bernard</td>
<td>ONERA</td>
<td>France</td>
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<tr>
<td>Vaitekunas David</td>
<td>W.R. Davis Engineering Ltd.</td>
<td>Canada</td>
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Organizing Committee ITBMS 2016: ONERA Toulouse
Contact: itbms@onera.fr
VENUE

ITBMS 2016 will take place at Château de Pennautier, 5km from Carcassonne, France.

Toulouse-Blagnac Airport (90km to Carcassonne)
International flights: www.toulouse.aeroport.fr/en

Carcassonne Airport for flights operated by Ryanair
www.aeroport-carcassonne.com
www.ryanair.com

Accommodation
More information on www.tourism-carcassonne.co.uk/prepare/where-stay/hotels
# PROGRAM

## DAY 1 – Monday, June 27

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30 – 10:00</td>
<td>Registration</td>
</tr>
<tr>
<td>10:00 – 10:15</td>
<td>Welcome address and workshop organization</td>
</tr>
<tr>
<td></td>
<td>Nicolas Riviere</td>
</tr>
<tr>
<td>10:20 – 12:30</td>
<td><strong>SESSION 1</strong> System performances</td>
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<tr>
<td></td>
<td>Chair: Bernard Rosier</td>
</tr>
<tr>
<td>10:20 – 12:30</td>
<td>An approach of validating for using the NV-IPM software in the I2 domain for the DGA missions</td>
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<tr>
<td></td>
<td>G. Swiathy, J.P. Durand, M. Le Port, M.A. Guenier, T. Vallas</td>
</tr>
<tr>
<td>10:20 – 12:30</td>
<td>The European Computer Model for Optronic System Performance Prediction (ECOMOS) Overview and State of Work</td>
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<td></td>
<td>E. Repasi, P. Bijl, L. Labarre, W. Wittenstein, H. Buersing</td>
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<tr>
<td>10:20 – 12:30</td>
<td>Performance Assessment of Electro-optical Systems with TRM4v2 – Status and Future</td>
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<td></td>
<td>S. Kessler, J. Mündel</td>
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<tr>
<td>10:20 – 12:30</td>
<td>Proposing some mathematical artefacts, helping MWIR cameras to detect objects which mostly emit in the LWIR wavelengths</td>
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<td></td>
<td>M. Brun</td>
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<td>10:20 – 12:30</td>
<td>The “Neon” Tactical Decision Aid Programme</td>
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<tr>
<td></td>
<td>W. Lewis, C. Chapple, D. Wilson</td>
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<tr>
<td>12:30 – 14:00</td>
<td>Lunch</td>
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</tbody>
</table>

## SESSION 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Activity</th>
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<tbody>
<tr>
<td>14:00 – 15:00</td>
<td><strong>SESSION 2</strong> Target</td>
</tr>
<tr>
<td></td>
<td>Chair: David A. Vaitekunas</td>
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<tr>
<td>14:00 – 15:00</td>
<td>800 nm - 4100 nm Mid-Infrared Supercontinuum Laser Sources for Application in Spectroscopy</td>
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<tr>
<td></td>
<td>F. Gaudfrin, G. Huss, R. Ceolato, S. Poulain, N. Riviere</td>
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<tr>
<td>14:00 – 15:00</td>
<td>Towards Broadband Near and Mid-Infrared Signatures Measurements from New Supercontinuum Laser Sources</td>
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<tr>
<td></td>
<td>R. Ceolato, C. Martin, N. Riviere</td>
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<tr>
<td>15:00 – 15:30</td>
<td>Coffee Break</td>
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</tbody>
</table>

## SESSION 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Activity</th>
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<tbody>
<tr>
<td>15:30 – 17:00</td>
<td><strong>SESSION 3</strong> Target</td>
</tr>
<tr>
<td></td>
<td>Chair: Al Curran</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Modeling and simulation of wet painted surfaces</td>
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<tr>
<td></td>
<td>M. Beecroft, R. Ben-Dov, J. Jafolla, A.B. Lessin, B. Milgrom, A. Reinov, D. Steiner</td>
</tr>
<tr>
<td>15:30 – 17:00</td>
<td>Prediction of surface temperatures of large-vehicle targets</td>
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<td></td>
<td>W. Lewis, H. Rance, R. King, D. Bentley, D. Wilson</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Shock wave detection and reconstruction with BOS technique</td>
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<tr>
<td></td>
<td>D. Donjat, F. Nicolas, G. Le Besnerais, A. Pyer, F. Micheli, F. Champagnat</td>
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<tr>
<td>17:00</td>
<td>End of the day</td>
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### DAY 2 – Tuesday, June 28

**SESSION 4**  
09:00 – 10:20  
**Validation and IR applications**  
Chair: Nicolas Riviere

- Trapped Victim Detection using a Miniaturized LWIR Camera  
P. Agrafiotis, A. Doulamis, G. Athanasiou, A. Amditis

- Synthetic IR images from a geostationary satellite  
T. Cathala, N. Moreau

- Towards the numerical transition of ecological engineering  
S. Moulherat, O. Fauvelet

- Topological and thermographic data acquisitions by drone  
O. Anquetin

10:20 – 11:00  
Coffee Break and Drone Demonstration

**SESSION 5**  
11:00 – 12:00  
**Real time imaging simulation techniques**  
Chair: Alain Le Goff

- GPU Based Infrared Signature Modeling and Scene Simulation  
Ç. Kavak, G. Bozdağı Akar

- New features of SE-Workbench EO rendering  
T. Cathala, J. Latger

12:00 – 13:30  
Lunch

**SESSION 6**  
13:30 – 14:50  
**Imaging simulation techniques**  
Chair: Romain Ceolato

- MATISSE V3 – Overview and future developments  
L. Labarre, L. Croizé, S. Fauqueux, T. Huet, C. Halherbe, J. Pierrez

- Infrared real time globe viewing  
J. Latger, T. Cathala

- Acceleration of ray tracing technique using CUDA  
J. Latger, T. Cathala

14:50 – 15:10  
Coffee Break

**SESSION 7**  
15:10 – 16:00  
**Thermal modeling and data**  
Chair: Jean Latger

- Collection of physical material databases for the SE-Workbench-EO  
A. Le Goff

- Thermal and Infrared Simulation of Camouflaged Human Dismounts  
C.D. Packard, M.D. Klein, T.S. Viola, M.A. Hepokoski

16:00  
End of the day

17:00 – 23:30  
Social Event
## DAY 3 – Wednesday, June 29

### SESSION 8
**09:00 – 10:50**
**Thermal modeling and data**
Chair: Nicolas Riviere

- **Davis Engineering: Corporate presentation**
  D.A. Vaitekunas

- **ThermoAnalytics: Corporate presentation**
  A. Curran, F. Godillon

- **Alteration of thermal signatures using heat pipes**
  M. Winkelmann

**10:00 – 10:20**
**Coffee Break**

### SESSION 9
**10:50 – 12:00**
**Maritime objects and background**
Chair: Endre Repasi

- **Simulation of Whitecaps and their Radiometric Properties in the SWIR**
  F. Schwenger, E. Repasi

- **3D Flare Particle Model for ShipIR/NTCS**
  S. Ramaswamy, D.A. Vaitekunas

- **Comparison of 3D Flare Particle Model with Actual Measurements**
  D.A. Vaitekunas, S. Ramaswamy, W. Gunter, F. February

**12:00 – 13:30**
**Lunch**

### SESSION 10
**13:30 – 15:00**
**Active imaging and Laser**
Chair: Warren Lewis

- **Laser imaging techniques to improve the vision for situational awareness**
  N. Riviere, A. Coyac, P.E. Dupouy, R. Ceolato, L. Hespel

- **Geiger-mode avalanche photodiode for airborne 3D mapping**
  A. Coyac, N. Riviere

- **ALARMS: innovAtive Laser imAging technologies with extended Range for Maritime Surveillance**

- **OEM Fiber Laser Rangefinder for long-distance measurement**
  N. Picard

**15:00 – 15:30**
**Coffee Break**

### SESSION 11
**15:30 – 16:50**
**Impact of climatic conditions on signatures**
Chair: Laurent Hespel

- **Aerosol impacts on contrast**
  A.M.J. van Eijk, J. Piazzola, G. Tedeschi, K. Stein

- **3D Cloud investigation and radiance calculation for background modeling**
  C. Bellisario, C. Malherbe, F. Sczcap

- **Solar loading and Wind effects on Infrared Signatures in False Bay**
  F. February, W. Gunter

**17:00**
**End of the day**
### DAY 4 – Thursday, June 30

<table>
<thead>
<tr>
<th>SESSION 12</th>
<th>Training sessions</th>
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<tbody>
<tr>
<td>09:30 – 11:00</td>
<td>OKTAL-SE</td>
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<tr>
<td>11:00 – 11:20</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>11:20 – 12:30</td>
<td>OKTAL-SE</td>
</tr>
<tr>
<td>12:30 – 14:00</td>
<td>Lunch</td>
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